

CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

- 1 1. A computer implemented method for designing and planning workforce evolution comprising the steps of:
 - 3 identifying a portfolio of candidate workforce organizational topologies;
 - 5 comparing said candidate topologies for suitability of employment against a mix of workforce topological internal and external constraints; and
 - 7 defining criteria for selection of at least one candidate topology for a specified mix of internal and external constraints.
- 1 2. The computer implemented method according to claim 1, further comprising the step of identifying an original workforce organizational topology, said topology specifying viable paths from one node to another in the workforce organizational topology.
- 1 3. The computer implemented method according to claim 2, wherein the workforce organizational topology has a tree structure.
- 1 4. The computer implemented method according to claim 2, wherein the workforce organization topology has a grid structure.
- 1 5. The computer implemented method according to claim 2, wherein the workforce organization topology has a star structure.

- 1 6. The computer implemented method according to claim 2, wherein the
 - 2 workforce organization topology has a cluster structure.
 - 1 7. The computer implemented method for designing and planning workforce
 - 2 evolution recited in claim 1, wherein the step of defining criteria for selection
 - 3 of at least one candidate topology comprises the steps of:
 - 4 computing a cost as a function of candidate topologies; and
 - 5 selecting an optimal topology by finding the topology which
 - 6 minimizes the cost among the space of topologies satisfying the constraints.
 - 1 8. The computer implemented method for designing and planning workforce
 - 2 evolution recited in claim 7, further comprising the step of characterizing the
 - 3 workforce evolution over time as a function of dynamic workforce events.
 - 1 9. The computer implemented method for designing and planning workforce
 - 2 evolution recited in claim 8, wherein the step of characterizing the workforce
 - 3 evolution over time comprises the steps of:
 - 4 identifying one or more time periods of interest;
 - 5 populating the model with evolution rates data;
 - 6 identifying a present state; and
 - 7 computing an achievable state of the workforce.
 - 1 10. The computer implemented method for designing and planning workforce
 - 2 evolution recited in claim 8, wherein the dynamic workforce events comprise
 - 3 intra-workforce events, wherein the intra-workforce events comprise
 - 4 transitions within the workforce, including promotions, demotions and
 - 5 transfers, and inter-workforce events, wherein the inter-workforce events
 - 6 comprise arrivals to the workforce and departures from the workforce.

1 11. The computer implemented method for designing and planning workforce
2 evolution recited in claim 1, further comprising the step of identifying
3 feasibility of target states of the workforce.

1 12. The computer implemented method for designing and planning workforce
2 evolution recited in claim 11, wherein the step of identifying feasibility of
3 target states comprises the steps of:

4 identifying one or more target states;

5 computing achievable states and checking whether the achievable
6 states are one of the target states; and

7 identifying a space of controlled evolution rates and computing
8 elements of the space of controlled evolution rates, which after
9 implementation would result in one of the target states, or identifying that no
0 such element of the space of controlled evolution rates exists.

1 13. The computer implemented method for designing and planning workforce
2 evolution recited in claim 1, further comprising the step of computing a cost of
3 operating a workforce evolution network.

1 14. The computer implemented method for designing and planning workforce
2 evolution recited in claim 13, wherein the step of computing a cost of
3 operating a workforce evolution network comprises the steps of:

4 formulating a workforce evolution model;

5 identifying one or more time periods of interest;

6 populating the model with evolution rates data and cost data;

7 identifying a present state; and

computing a cost of operating the network over the time periods of

9 interest.

1 15. The computer implemented method for designing and planning workforce
2 evolution recited in claim 14, wherein the step of computing a cost of
3 operating the network computes an optimal cost of operating the network over
4 the time periods of interest and identifies a policy which achieves the optimal
5 cost of operation.

1 16. The computer implemented method for designing and planning workforce
2 evolution recited in claim 15, wherein the optimal cost of operating the
3 network is computed by means of an enumerative computations method
4 consisting of exhaustively considering every element of the space of
5 controlled evolution rates, fixing it as a numerical value for evolution rates
6 and computing an associated cost of operating the network under a considered
7 vector of evolution rates.

1 17. The computer implemented method for designing and planning workforce
2 evolution recited in claim 15, wherein the optimal cost of operating the
3 network is computed by means of optimization methods of identifying the
4 optimal cost of operating the workforce network and identifying an optimal
5 policy using mathematical optimization techniques.

1 18. The computer implemented method for designing and planning workforce
2 evolution recited in claim 14, wherein when transition rates for links of the
3 workforce evolution network are given by numerical network, the cost of
4 operating the network comprises the steps of:
5 computing achievable states for each end point of time periods
6 considered;

7 computing for time periods cost corresponding the achievable state at
8 the beginning and at the end of the period;

9 computing an average of two resulting values and multiplying by a
10 length of the period; and

11 summing the averages over all the considered time periods.

1 19. The computer implemented method for designing and planning workforce
2 evolution recited in claim 14, wherein when the transition rates for the links of
3 the workforce evolution network are given by probability distribution
4 functions, the cost of operating the network is obtained using a fluid models
5 based method wherein for each of link of the workforce network and a
6 corresponding probability distribution of an evolution rate, the expected value
7 of the evolution rate is computed and the expected values are then taken as
8 numerical values for the evolution rates and a corresponding cost of operating
9 the network is computed.

1 20. The computer implemented method for designing and planning workforce
2 evolution recited in claim 14, wherein in when the transition rates for the links
3 of the workforce evolution network are given by probability distribution
4 functions, the cost of operating the network is obtained using a convolution
5 method based computation of the cost by constructing a distribution function
6 of a vector of transition rates for each of the considered time periods using the
7 distribution functions of the rates of individual links corresponding to the
8 considered time periods, then computing a convolution function of these
9 vector distribution functions corresponding to the end of each periods
10 resulting in the distribution function of the state of the network at the end of
11 each time period as well as the joint distribution of the state of the system over
12 all the end points of the considered periods.

- 1 21. A computer system implementing a method for designing and planning
2 workforce evolution comprising:
 - 3 a human resources data base storing data pertaining to skill levels
4 within a plurality of job groups;
 - 5 a query layer for accessing the human resources data base and one or
6 more external data bases;
 - 7 a job extraction function, a transitions extraction function and a current
8 state extraction function accessing the human resources data base and one or
9 more external data bases through said query layer;
 - 10 a model formulation layer identifying a portfolio of candidate
11 workforce organizational topologies to generate model data; and
12 and a solution layer comparing said candidate topologies for suitability
13 of employment against a mix of workforce topological internal and external
14 constraints and defining criteria for selection of at least one candidate
15 topology for a specified mix of internal and external constraints.
- 1 22. The computer system implementing a method for designing and planning
2 workforce evolution recited in claim 21, wherein the human resources data
3 base and said one or more external data bases are geographically distributed
4 and accessible by a global network.
- 1 23. The computer system implementing a method for designing and planning
2 workforce evolution recited in claim 22, wherein the global network is the
3 Internet and the query layer includes a browser.
- 1 24. The computer system implementing a method for designing and planning
2 workforce evolution recited in claim 23, wherein job extraction function, the

3 transitions extraction function, the current state extraction function, the model
4 formulation layer, and the solution layer are comprised of a server having one
5 or more clients attached.

1 25. The computer system for implementing a method for designing and
2 planning workforce evolution recited in claim 21, wherein the solution layer
3 defines criteria for selection of at least one candidate topology by computing a
4 cost as a function of candidate topologies and selecting an optimal topology by
5 finding the topology which minimizes the cost among the space of topologies
6 satisfying the constraints.

1 26. The computer system for implementing a method for designing and
2 planning workforce evolution recited in claim 21, wherein the solution layer
3 identifies one or more target states, computes achievable states and checks
4 whether the achievable states are one of the target states, and identifies a space
5 of controlled evolution rates and computing elements of the space of
6 controlled evolution rates, which after implementation would result in one of
7 the target states, or identifying that no such element of the space of controlled
8 evolution rates exists.

1 27. The computer system for implementing a method for designing and
2 planning workforce evolution recited in claim 21, wherein the solution layer
3 computes a cost of operating a workforce evolution network by formulating a
4 workforce evolution model, identifying one or more time periods of interest,
5 populating the model with evolution rates data and cost data, identifying a
6 present state, and computing a cost of operating the network over the time
7 periods of interest.